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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/526,009

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Akiyoshi Fujii

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EXAMINER

KALAM, ABUL

ART UNIT

PAPER NUMBER

2814

NOTIFICATION DATE

DELIVERY MODE

05/01/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/526,009	FUJII ET AL.	
	Examiner	Art Unit	
	Abul Kalam	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,9,10,26-29,34 and 35 is/are pending in the application.
- 4a) Of the above claim(s) 2-6 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,10,26-29,34 and 35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/11/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 19, 2008, has been entered.

Election/Restrictions

2. In the remarks filed on November 13, 2006, Applicant elected Species of Embodiment 5, directed to Figs. 39-43, without traverse. Applicant also stated that claims 1-6, 9, 10, 26, 27, 28, 29, 34 and 35 are directed to the elected species, and at least claims 1-4, 10, 26, 29, 34 and 35 are generic. However, upon further review, it appears that only claims 1, 10, 26-29, 34 and 35 read on the elected species. Claims 2-4 are drawn to Figs. 33-36 of Embodiment 3 and claims 5, 6 and 9 are drawn to Figs. 37 and 38 of Embodiment 4, as set forth in the restriction requirement mailed on October 11, 2006. Thus, claims 2-6 and 9 are withdrawn from further consideration for being drawn to a non-elected invention. Furthermore, note that only claim 1 is generic to all the species.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 1, 10, 26-29, 34 and 35** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In lines 3-5 of claim 1, the limitation of “a semiconductor layer, that has been etched after a mask material is dropped on a semiconductor film” is unclear and ambiguous, because it appears from the specification, that the “semiconductor film” and not the “semiconductor layer,” as claimed, is etched after a mask material is dropped on the semiconductor film. Thus, the limitation will be interpreted by the Office as --a semiconductor layer, formed by etching a semiconductor film after a mask material is dropped onto the semiconductor film--. Claims 10 and 34 depend from claim 1, and thus, are also rejected from the same reasons as discussed above. The limitation discussed above is also recited in lines 2-4 of claim 26, and thus, claim 26 and its dependent claims 27-29 and 35 are also rejected for the reasons stated above with regard to claim 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. **Claims 1, 10 and 34** (*as best understood by the Office*) are rejected under 35 U.S.C. 102(a) as being anticipated by Wong et al. ("Amorphous silicon thin-film transistors and arrays fabricated by jet printing;" newly cited, hereinafter, Wong).

With respect to **claim 1**, Wong teaches a TFT array substrate, comprising:
a thin film transistor section (**FIG. 2**) in which a gate electrode ("**Cr gate**," **FIG. 2b**) is formed on a substrate ("**glass substrates**," **pg. 611, 1st ¶**), and
a semiconductor layer ("**a-Si layer**," **pg. 611, 1st ¶**), formed by etching a semiconductor film after a mask material ("**printed wax**," **pg. 611, 2nd ¶**) is dropped onto the semiconductor film (**FIGs. 2c-2d**), is formed on the gate electrode ("**Cr gate**," **FIGs. 2b-2c**) via a gate insulation layer ("**Si₃N₄**" **layer formed over the gate, FIG. 2c**), wherein the semiconductor layer ("**a-Si**," **FIGs. 2c-2d**) having a shape formed by dropping a droplet (**pgs. 610-611**).

With respect to claim 10, Wong teaches a flat panel display device including the TFT array substrate as set forth in the claim 1 (**pg. 610, 1st ¶**). Regarding the limitation of a "liquid crystal display device," note that LCD devices comprising TFT array substrates are well known and conventional in the art. Furthermore, it has been held

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that a preamble is denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

With respect to claim 34, Wong teaches an electronic device including the TFT array substrate as set forth in claim 1 (**pg. 610, 1st ¶**). Regarding the limitation of an electronic device, it has been held that a preamble is denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Claim Rejections - 35 USC § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 26-29 and 35** (*as best understood by the Office*) are under 35

U.S.C. 103(a) as being unpatentable over Yoo et al. (US 2002/0180898; newly cited, hereinafter, Yoo) in view of Wong (cited above).

With respect to **claim 26**, Yoo discloses a thin film transistor array substrate (**Figs. 6-8**), comprising:

a thin film transistor array section (**Fig. 6, "TFT"**) in which a gate electrode (**33, Fig. 7**) is formed on a substrate (**31, Fig. 7**), and in which a semiconductor layer (**45 and 47; Fig. 7 and 8c**) and a conductor layer (**36a, Fig. 8c**) are formed on the gate electrode (**31**) via a gate insulation layer (**45, Fig. 8c**);

wherein the conductor layer (**36; Figs. 8c**) is formed in contact with the semiconductor layer (**45 and 47, Fig. 8c**) and one of source and drain electrodes (**35, 37, Fig. 8c**) of the thin film transistor section, wherein the conductor layer (**36a, Fig. 8c**) and the semiconductor layer (**45 and 47**) having substantially the same shape (**Fig. 6 and 8c; ¶ [0056]-[0058], [0063]-[0066]**).

Thus, Yoo teaches all the limitations of the claim including wherein the conductor (**36a, Fig. 8c**) layer is part of the source and drain electrodes (**35 and 37; ¶ [0057]**).

However, Yoo does not teach wherein the semiconductor layer is formed by etching a semiconductor film after a mask material is dropped onto the semiconductor film; and wherein the conductor layer and the semiconductor layer have substantially the same shape in a portion where the conductor was formed by dropping a droplet.

Wong teaches a TFT array substrate (**FIGs. 2 and 4**) wherein the semiconductor layer ("**a-Si layer**," **pg. 611, 1st ¶**) is formed by etching a semiconductor film after a mask material ("**printed wax**," **pg. 611, 2nd ¶**) is dropped onto the semiconductor film (**FIGs. 2c-2d**); wherein the source and drain electrodes ("**source-drain metal**," **pg. 611, 1st ¶**) have a portion formed by dropping a droplet (**pg. 611, 3rd ¶**), the source/drain

electrodes (**Fig. 2f**) and the semiconductor layer ("**a-Si**," **FIGs. 2c-2d**) having substantially the same shape in the portion formed by dropping a droplet (**pgs. 610-611: both the source/drain electrode and the semiconductor layer were formed dropping droplets (mask) onto the layers and then patterning the layers**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of Wong into the invention of Yoo, thereby forming the conductor layer and the semiconductor layer using printed masks in place of conventional photolithography, because such a modification would have been considered a mere substitution of art recognized equivalents (**Yoo, pg. 610: abstract**) (MPEP 2144.06).

Regarding claims 27 and 28, Yoo discloses wherein the conductor layer is constituted of one of Mo, W, Cr, Ta, and Ti (**¶ [0057]**) and the source and drain electrodes are made of Al (**¶ [0057]**).

Regarding claim 29, Yoo discloses a liquid crystal display device (**FIG. 6, ¶ [0056]**) including the TFT array substrate as set forth in claim 26.

Regarding claim 35, Furusawa discloses an electronic device (**FIG. 6, ¶ [0056]**) including the TFT array substrate as set forth in claim 26.

Response to Arguments

6. Applicant's arguments with respect to claims 1, 10, 26-29, 34 and 35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abul Kalam whose telephone number is (571)272-8346. The examiner can normally be reached on Monday - Friday, 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. K./
Examiner, Art Unit 2814

/Phat X Cao/
Primary Examiner, Art Unit 2814